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COOLING WATER INTAKE STRUCTURES

Proposal Regarding Minimizing Adverse Environmental Impact

ENVIRONMENTAL PROTECTION AGENCY

[40 CFR Parts 401, 402]

COOLING WATER INTAKE STRUCTURES

Proposal Regarding Minimizing Adverse Environmental Impact

Notice is hereby given of proposal of the regulations set forth below concerning determinations required to insure that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact. The regulations are intended to implement section 316(b) of the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251, 1326; Pub. L. 92–500; 86 Stat. 816 et seq.) (the Act).

Section 316(b) of the Act requires that "any standard established pursuant to section 301 or section 306 of this Act and applicable to a point source shall require that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact." The Environmental Protection Agency (EPA) will be publishing a series of regulations establishing effluent limitations guidelines for existing sources and standards of performance for new sources pursuant to sections 301, 304(b), and 306 of the Act. These regulations will be set forth under Parts 401 et seq. of Title 40 CFR.

The regulations set forth below in tentative form provide for an amendment to 40 CFR Part 401 (General Provisions concerning effluent limitations guidelines and standards of performance) and the establishment of a new Part 402, 40 CFR. The General Provisions set forth in Part 401 were published in proposed form on August 22, 1973 (38 FR 22606, 22608). The regulations below amend Part 401 as proposed to add section 316(b) to the catalogue of applicable legal authorities set forth under 40 CFR 401.12. In addition, new § 401.14 below provides that the location, design, construction, and capacity of cooling water intake structures for any point source for which a standard is established pursuant to section 301 or 306 shall reflect the best technology available for minimizing adverse environmental impact in accordance with the provisions of 40 CFR Part 402.

New Part 402 as proposed is intended to provide a framework for the case-by-case determination of the best technology available for minimizing adverse environmental impact resulting from the location, design, construction and operation of cooling water intake structures. The provisions of Part 402 do not set forth mandatory design and operational requirements since the factors to be considered would lead to highly site-specific determinations of the best technology available for minimizing adverse environmental impact. However, when considering cooling water intake requirements in connection with application for NPDES permits pursuant to section 402 of the Act, the factors set forth in Part 402 must be examined in order to establish requirements for minimizing adverse environmental impact. The regulations of Part 402 are therefore intended to serve as an outline of the factors to be considered, and the data required, in order to arrive at an environmentally sound decision concerning cooling water intake structure, location, design, construction, and operation.

The Part 402 regulations were developed in the course of studies undertaken in support of effluent limitations guidelines and standards of performance for the steam electric power generating industry. Water withdrawal for cooling by all industrial point sources now amounts to approximately 70 trillion gallons per year. Steam electric powerplants withdraw approximately 80 percent of this, or 60 trillion gallons per year, which is roughly 15 percent of the total flow of waters in U.S. rivers and streams. The intake flow for a typical steam electric powerplant is 40 billion gallons per year.

The intake flow for typical petroleum refineries, primary metals manufacturing plants, chemical manufacturing plants, and pulp and paper mills are about one-tenth the intake flow of typical steam electric powerplants. Flows from large rubber, wood, food, stone, clay and glass products manufactures are typically about one-hundredth the flow of powerplants. Cooling water intake flows for textile mills and leather manufacturers are typically about one-thousandth the flow of powerplants. However, the maximum cooling water volumes for specific establishments will be dependent on factors such as products, processes employed, size of plant, degree of recirculation employed in the cooling water system, etc.

Adverse environmental impacts that could occur from cooling water intakes relate to the net damage or destruction of benthos, plankton and necton organisms by external interaction with the intake structure and by internal interaction with the industrial cooling system. Important aspects of the intake which relate to adverse environmental impacts are the intake volume, the number and types of organisms which interact externally with the intake or which interact internally with the industrial cooling system, the configuration and operational characteristics of the intake and plant cooling system, the thermal characteristics of the cooling system, and the chemicals added to the cooling system for biological control.

(a) *Applicable technology.* The range of technologies corresponding to the control of the number and types of organisms which interact externally with the intake is comprised of two factors—the choice of the location of the intake relative to the location of the organisms, and the full array of process modifications including the use of recirculating cooling water systems employing offstream means to transfer process heat directly to the atmosphere and to minimize or in some cases eliminate the use of cooling water. The technology for controlling the number and types of organisms which interact internally with the cooling system is compromised of one factor in addition to location and flow volume controls as cited above for intake interactions, i.e., the degree to which the configuration and operation of the intake means prevents the entry of these organisms into the cooling system. The technology for preventing the entry of these organisms while minimizing damage due to external interactions with the organisms is diverse, including a multiplicity of physical and behavior barriers and covering various fish bypass and removal systems.

Devices which cause damage due to internal interactions with process cooling systems relate to the design and operation of these systems with respect to mechanical, thermal, and chemical characteristics. For example, the presence of a cooling tower in a nonrecirculating cooling system could affect the amount of organism damage due to the pumping, temperature changes, and possible chemical additives employed with the tower.

A document entitled "Development Document for Proposed Best Technology Available for Minimizing Adverse Environmental Impact of Cooling Water Intake Structures" further details the analysis undertaken in support of the regulations being proposed below. The draft contractor's report on the steam electric power industry circulated for comments in early July, 1973, contained the cooling water intake structures technology considered in the EPA document cited above.

A copy of the "Development Document" is available for inspection at the EPA Information Center, Room 227, West Tower, Waterside Mall, 4th & M Street, SW., Washington, D.C., at all EPA regional offices, and at State water pollution offices. Copies of the document are being sent to persons or institutions affected by the proposed regulations, or who have placed themselves on a mailing list for this purpose (see EPA's Advance Notice of Public Review Procedures, 38 FR 21202, August 6, 1973). In this regard, all persons who have requested the Development Documents for "Steam Electric Power Plants," "Iron and Steel Manufacturing" or "Ferralloy Manufacturing" will also receive a copy of the "Cooling Water Intake Structures" Development Document. An additional limited number of copies of the report are available. Persons wishing to obtain a copy may write the EPA Information Center, Environmental Protection Agency, Washington, D.C. 20460, Attention: Mr. Phillip B. Wisman.

(b) *Costs.* The Development Document contains information concerning the performance and costs of various technologies for minimizing environmental damage from cooling water intake structures for steam electric power plants. The analysis indicates that in general the costs associated with the choice of intake location or application of various intake devices to minimize damage due to internal interactions will

have a small economic impact on steam electric power plants.

The Agency expects the same measures necessary to minimize adverse environmental impacts from steam electric power plant cooling water intakes will be applicable to other industries utilizing cooling water in their manufacturing processes. Since the steam electric power industry utilizes the greatest volume of cooling water, the total cost which will result from applying the best technology available for cooling water intake structures will clearly be greatest in that industry. Although the Agency possesses some data with respect to the cost of the application of the cooling water intake requirements to other industries, the Agency recognizes that the Development Document for cooling water intakes was prepared with specific reference to the steam electric power industry. Therefore, the Agency requests comments, and if possible additional data, concerning the cost and economic impact of the application of the measures listed in the Development Document to industries other than the steam electric power industry. These comments should be directed toward the costs and impacts of biological studies required for assessing environmental damages as well as the costs and impacts of remedial measures. Comments which provide such additional information as to costs should include a detailed explanation of the methodology used to derive the cost estimates. Additional issues about which the Agency seeks specific comments are: The question of whether, and how, a distinction should be drawn between existing and new cooling water intake structures and the question of whether, and how, a distinction should be drawn between large and small volume cooling water intake structures.

(c) *Summary of public participation.* Prior to this publication, the agencies and groups listed below were consulted with respect to the development of the regulations below. (Members of this group were also consulted with respect to the effluent limitations guidelines and standards of performance for the steam electric power industry). A draft of the development document containing the cooling water intake structures information was sent to all participants and comments were solicited on that report.

(1) Effluent Standards and Water Quality Information Advisory Committee (established under section 515 of the Act); (2) all State Pollution Control Agencies; (3) the Edison Electric Institute; (4) American Public Power Association; (5) Atomic Industrial Forum, Inc.; (6) Tennessee Valley Public Power Association; (7) The American Society of Mechanical Engineers; (8) Hudson River Sloop Restoration, Inc.; (9) The Conservation Foundation; (10) Environmental Defense Fund, Inc.; (11) Natural Resources Defense Council, Inc.; (12) Business and Professional People for the Public Interest; (13) The American Society of Civil Engineers; (14) Water Pollution Control Federation; (15) National Wildlife Federation; (16) National Association of Electric Companies; (17) National Rural Electric Cooperative Association; (18) New England Interstate Water Pollution Control Commission; (19) Ohio River Valley Sanitation Commission; (20) Government of Guam; (21) Trust Territory of the Pacific Islands; (22) Puerto Rico; (23) Delaware River Basin Commission; (24) U.S. Department of Commerce; (25) U.S. Department of the Interior; (26) U.S. Water Resources Council; (27) U.S. Department of Treasury; (28) U.S. Atomic Energy Commission; (29) U.S. Department of Defense; (30) U.S. Department of Agriculture; (31) Tennessee Valley Authority; and (32) U.S. Department of Housing and Urban Development.

The following organizations responded with comments relative to the cooling water intake structures information: Effluent Standards and Water Quality Information Advisory Committee (established under section 515 of the Act); Honorable Mike McCormack; U.S. Department of the Treasury; Atomic Industrial Forum, Inc.; Delaware River Basin Commission; Edison Electric Institute; U.S. Atomic Energy Commission; U.S. Water Resources Council; Southern Electric Generating Company; Consumers Power Company; American Electric Power Service Corporation; Virginia Electric and Power Company; Duke Power Company; Commonwealth Edison; Southern Services, Inc.; Public Service Electric and Gas Company; Tennessee Valley Authority; Los Angeles Department of Water and Power; Bechtel Power Corporation; New York Power Pool; U.S. Department of Agriculture; Gulf Power Company; Mississippi Power Company; Consolidated Edison Company of New York, Inc.; Georgia Power Company; American Public Power Association; National Advisory Committee on Oceans and Atmosphere; Tennessee Valley Public Power Association; Detroit Edison; Southwestern Electric Power Company; City Public Service Board of San Antonio; U.S. Department of Defense; U.S. Department of Commerce; Florida Power and Light Company; Federal Power Commission; Natural Resources Defense Council, Inc.; Hudson River Fishermen's Association; Tampa Electric Company; State of Illinois Environmental Protection Agency; State of Maryland Department of Natural Resources; State of Michigan Department of Natural Resources; State of Ohio Environmental Protection Agency; State of North Carolina Department of Natural and Economic Resources; State of Texas Water Quality Board.

The primary issues raised in the development of the proposed regulations and the treatment of these issues herein are as follows. Public comments on all these suggestions are solicited.

1. Some commenters suggested the consideration of type and design of intakes on a case-by-case basis due to the high degree of site specificity involved. While this view is warranted with respect to the outcome, a certain degree of national uniformity can be prescribed relative to the factors that must be considered. Section 402.12 below is intended to fulfill this need.

2. Some commenters suggested that the evaluation of existing intake structures be concerned with their environmentally related performance rather than their location, configuration, and operation. While environmentally related performance would provide a measure of the effect desired, it must be related to control technology in order to be assured that adverse environmental impacts are minimized in any particular case.

3. Some commenters feel that location is by far the most important aspect of intake technology related to environmental impact. Furthermore, they feel that no large intake structure should be located in an estuarine water body. This would mean that all powerplants on estuaries would be required to employ closed-cycle cooling systems. While location is no doubt the most important factor involved, and estuarine sites in general would have a high potential for adverse environmental impact, no data is available to support evaluations leading to specific intake structure requirements other than on a case-by-case basis.

4. Some commenters feel that the biological data gathered to support consideration of factors related to cooling water intake structures should be obtained by the Environmental Protection Agency or under contract with independent research organizations. The qualifications of the investigator and the data obtained should stand on the merits of each case.

Interested persons may participate in this rulemaking by submitting written comments in triplicate to the EPA Information Center, Environmental Protection Agency, Washington, D.C. 20460, Attention: Mr. Philip B. Wisman. Comments on all aspects of the proposed regulations are solicited. In the event comments are in the nature of criticisms as to the adequacy of data which is available, or which may be relied upon by the Agency, comments should identify and, if possible, provide any additional data which may be available and should indicate why such data is essential to the development of the regulations. In the event comments address the approach taken by the Agency in establishing an effluent limitation guideline or standard of performance, EPA solicits suggestions as to what alternative approach should be taken and why and how this alternative better satisfies the detailed requirements of sections 301, 304(b), 306 and 307 of the Act.

A copy of all public comments will be available for inspection and copying at the EPA Information Center, Room 227, West Tower, Waterside Mall, 401 M Street, SW., Washington, D.C. A copy of preliminary draft contractor reports, the Development Document, and certain supplementary materials supporting the study of the industry concerned will also be maintained at this location for public review and copying. The EPA information regulation, 40 CFR Part 2, provides that a reasonable fee may be charged for copying.

All comments received on or before January 14, 1974 will be considered. Steps previously taken by the Environmental Protection Agency to facilitate public response within this time period are outlined in the advance notice concerning public review procedures published on August 6, 1973 (38 F.R. 21202).

Dated: December 7, 1973.

JOHN QUARLES,
Acting Administrator.

Part 401 is proposed to be amended as follows:

PART 401—GENERAL PROVISIONS

Sec.
401.14 Cooling water intake structures.

§ 401.12 Law authorizing effluent limitations guidelines, standards of performance and pretreatment standards for new sources.

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(i) Section 316(b) of the Act provides that any standard established pursuant to section 301 or section 306 of the Act and applicable to a point source shall require that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact.

§ 401.14 Cooling water intake structures.

The location, design, construction and capacity of cooling water intake structures of any point source for which a standard is established pursuant to section 301 or 306 of the Act shall reflect the best technology available for minimizing adverse environmental impact, in accordance with the provisions of Part 402 of this chapter.

PART 402—BEST TECHNOLOGY AVAILABLE FOR MINIMIZING ADVERSE ENVIRONMENTAL IMPACT OF COOLING WATER INTAKE STRUCTURES

Part 402 is proposed to read as follows:

Sec.
402.10 Applicability.
402.11 Specialized definitions.
402.12 Best technology available for cooling water intake structures.

§ 402.10 Applicability.

The provisions of this part are applicable to cooling water intake structures for point sources for which effluent limitations guidelines are established pursuant to section 301 or standards of performance are established pursuant to section 306 of the Act.

§ 402.11 Specialized definitions.

For the purpose of this part:

(a) The term "cooling water intake structure" shall mean the total structure used to direct water from a water body into the point source subject to the provisions of this part whenever the intended use of a major fraction of the water so directed is to absorb waste heat rejected from the process or processes employed or from auxiliary operations on the premises, including air conditioning.

(b) The term "existing cooling water intake structure" shall mean any cooling water intake structure, the construction of which was commenced before the date of publication of these proposed regulations.

(c) The term "new cooling water intake structure" shall mean any cooling water intake structure, the construction of which has been commenced on or after the date of publication of these proposed regulations.

(d) The term "Development Document" shall mean the document entitled "Development Document for Proposed Best Technology Available for Minimizing Adverse Environmental Impact of Cooling Water Intake Structures", and published by the U.S. Environmental Protection Agency.

§ 402.12 Best technology available for cooling water intake structures.

(a) The applicable factors set forth in the Development Document shall be considered to determine that the best available technology for minimizing the adverse environmental impact is reflected in an existing cooling water intake structure of a point source subject to standards established under sections 301 and 304(b) of the act.

(b) The factors set forth in the Development Document shall be used to determine that the location, design, construction and capacity of a cooling water intake structure of a point source subject to standards established under the provisions of section 306 and that the location, design, construction and capacity of a new cooling water intake structure of a point source subject to the standards established under the provisions of sections 301 and 304(b) of the Act reflect the best technology available for minimizing the adverse environmental impact.

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